Remarks/Arguments

Claims 1, 4-11, 14-17, 20, 21, 24, and 25 are pending in the present application. Claims 11 and 14-16 are allowed, and claims 4-6, 9, 24 and 25 are indicated as containing allowable subject matter. Claims 1, 7, 8, 10, 17, 20 and 21 stand rejected over cited art. No claims have been amended, added or canceled by this Amendment. Applicant has carefully considered the cited art and the Examiner's comments, and believes the claims patentably distinguish over the cited art in their present form. Reconsideration of the rejection is, accordingly, respectfully requested in view of the following comments.

I. 35 U.S.C. § 103, Obviousness – Claims 1, 7, 8, 17, 20 and 21

The Examiner has rejected claims 1, 7, 8, 17, 20 and 21 under 35 U.S.C. § 103(a) as being unpatentable over Kasahara et al. (U.S. Patent No. 6,710,818 B1) in view of Iwakawa et al. (U.S. Patent No. 6,208,433 B1). This rejection is respectfully traversed.

In rejecting the claims, the Examiner states:

> [Claim 1]
> Kasahara discloses a method for removing image artifacts from an image of a scene illuminated by a periodically varying light source, said image represented by an image data array comprising a plurality of rows of image data, the method comprising:
>
> determining a flicker function that models light emission of the periodically varying light source (e.g., column 8, line 28 – column 9, line 10), wherein said flicker function is a function of flicker amplitude, flicker frequency and flicker phase of the periodically varying light source (e.g., as shown in Fig. 4A the flicker is a function of amplitude, frequency, and phase based on the varying light source, Col. 9, lines 6-10, figure 4a teach that the output of dividing circuit 4 (figure 1) on the ordinate axis represents flicker and abscissas represents line number at a frame. Therefore in figure 4a, flicker is shown to be varying with amplitude, frequency and phase of a periodically varying light source. Line numbers of a particular frame represent the luminance level of particular pixel on which light from the varying light source is converted into electrical energy also stated in col. 8 lines 28-32) and
>
> processing said image data using said flicker function so as to remove said image artifacts from said image (e.g., column 15, lines 48-51; column 16, lines 5-13).
>
> Kasahara fails to disclose image data comprises an image data array comprised of a plurality of rows of image data, and wherein said processing step comprises dividing said image data by said flicker function on a row-by-row basis. However Iwakawa discloses said image data comprises an image data array comprised of a plurality of rows of image data, and wherein said processing step comprises dividing said image data by said flicker function on

a row-by-row basis (e.g., Examiner notes that the scene is scanned by the one-dimensional image sensor so as to generate two-dimensional image data wherein each row is corrected by dividing the image signal by the flicker function; column 5, lines 14-19 and 41-67, Also See col. 4 lines 12-32, figure 3).

Therefore taking the combined teachings of Kasahara and Iwakawa, it would be obvious to one skilled in the art at the time of the invention to have been motivated to have an image data array comprised of a plurality of rows of image data, and wherein said processing step comprises dividing said image data by said flicker function on a row-by-row basis in order to prevent the flicker due to line-by-line deviation (col. 5 lines 64-67).

Final Office Action dated June 16, 2006, pages 3-4.

In responding to Applicant's arguments presented in the Response to Office Action dated March 8, 2006, the Examiner further states:

Iwakawa teaches in figure 3 the principle of the invention wherein the compensated output Vc (x,y) corresponding to a pixel (x, y) on an original copy 31 is represented by the following equation (1):
Vc(X, Y) = VO*V(x, y)/**Vref(y)**.... (1)

where Vref(y) represents a flicker detection signal, V(x, y) represents a video signal of the original copy 31 (col. 4, lines 12-32). Similar to figure 3, figures 4-9 represent the first embodiment of the invention and have a division circuit 5 (figure 4) that performs the division Vin/Vref, using the sample hold Vref obtained from the sample-hold 3 (col. 5 lines 55-59). Therefore, Vref represents the flicker signal as explained in figure 3 according to a principle of the invention. Different rows are shown in figure 5a. Thus Iwakawa does teach dividing said image data by said flicker function on a row-by-row basis.

Final Office Action dated June 16, 2006, page 2.

Claim 1 is as follows:

1. A method for removing image artifacts from an image of a scene illuminated by a light source, said image represented by image data, the method comprising;

determining a flicker function, wherein said flicker function is a function of flicker frequency, flicker amplitude and flicker phase of said light source, and

processing said image data using said flicker function so as to remove image artifacts from said image, wherein said image data comprises an image data array comprised of a plurality of rows of image data, and wherein said processing step comprises dividing said image data by said flicker function on a row-by-row basis.

Applicant respectfully disagrees that Vref in Iwakawa represents "a flicker function, wherein said flicker function is a function of flicker frequency, flicker amplitude and flicker phase of said light source" as recited in claim 1; and, therefore also respectfully disagrees that Iwakawa discloses or suggests "processing said image data using said flicker function so as to remove image artifacts from said image, wherein said image data comprises an image data array comprised of a plurality of rows of image data, and wherein said processing step comprises dividing said image data by said flicker function on a row-by-row basis" as also recited in claim 1.

Although, as noted by the Examiner, Vref is described in Iwakawa as representing a "flicker detection signal", the signal does not represent a flicker function that is a function of the flicker frequency, flicker amplitude and flicker phase of a light source as required by claim 1. As described in col. 5, lines 30-37 of Iwakawa:

> A timing generation circuit **4** is designed to generate the timing signal for sampling the image signal by the prism **2** to supply the timing signal to the sample-hold circuit **3**. The division circuit **5** is designed to divide the image signal Vin obtained from the one-dimensional image pick-up device **1** by the signal Vref obtained from the sample-hold circuit **3**. An amplification circuit **6** is designed to perform the amplification required for the following circuits. (Emphasis added.)

Thus, as clearly stated above, signal Vref, by which image signal Vin is divided, is obtained from sample-hold circuit 3 . As described in col. 5, lines 20-29, however:

> A prism **2** receives an ambient light **13** and applies the ambient light to the photosensor array **9**. The whole light reception area **19** of the photosensor array **9** is provided with a reception area **12** for receiving light from the prism **2** and an area **11** for picking. up an image of the object. The reception area **12** and the area **11** are completely independent optically. No optical interference is therefore caused to occur. A sample-hold circuit **3** is designed to sample and hold the image signal by the prism **2** in the image signal obtained from the one-dimensional image pick-up device **1**. (Emphasis added.)

Thus, the prism receives ambient light only, and sample-hold circuit samples and holds the image signal from prism 2 such that Vref is an image signal representing only ambient light from prism 2.

Yet further, in col. 4, lines 16-21, it is stated:

> FIG. **3** models the component of the incident light into the image pick-up apparatus according to the present invention. Herein, it is assumed that the illumination **30** is composed of two types of light, for example, flicker containing fluorescent lamp and ambient light free from flicker such as sunlight. (Emphasis added).

From the above recitations in Iwakawa, it is clear that sample-hold circuit 3 in Figure 4 receives a light signal from prism 2, that the light from prism 2 is ambient light only, and that the ambient light is light that is free from flicker. Since the ambient light is free from flicker, Vref cannot represent a flicker function of any type, and certainly does not represent a "flicker function, wherein said flicker function is a function of flicker frequency, flicker amplitude and flicker phase of said light source" as recited in claim 1. Furthermore, because Vref does not represent a flicker function, Iwakawa does not disclose or suggest "processing said image data using said flicker function so as to remove image artifacts from said image, wherein said image data comprises an image data array comprised of a plurality of rows of image data, and wherein said processing step comprises dividing said image data by said flicker function on a row-by-row basis" as also recited in claim 1. Accordingly, Iwakawa does not supply the deficiencies in Kasahara and claim 1 is not obvious over Kasahara in view of Iwakawa.

Claims 7 and 8 depend from and further restrict claim 1 and also patentably distinguish over Kasahara in view of Iwakawa, at least by virtue of their dependency.

Independent claims 17 and 21 recite limitations similar to claim 1 and are allowable over Kasahara in view of Iwakawa for similar reasons as discussed above with respect to claim 1. Claim 20 depends from claim 17 and should be allowable in its present form at least by virtue of its dependency.

Therefore, the rejection of claims 1, 7, 8, 17, 20 and 21 under 35 U.S.C. § 103 has been overcome.

II. 35 U.S.C. § 103, Obviousness – Claim 10

The Examiner has rejected claim 10 under 35 U.S.C. § 103(a) as being unpatentable over Kasahara et al. (U.S. Patent No. 6,710,818 B1) and Iwakawa et al. (U.S. Patent No. 6,208,433 B1) and further in view of Applicant's Admitted Prior Art, herein AAPA. This rejection is respectfully traversed.

Claim 10 depends from and further restricts claims 1. Applicant's Admitted Prior Art does not supply the deficiencies in Kasahara and Iwakawa as described above, and claim 10 should, accordingly, be allowable in its present form, at least by virtue of its dependency.

Therefore, the rejection of claims 10 under 35 U.S.C. § 103 has been overcome.

III. Conclusion

For all the above reasons, it is respectfully urged that claims 1, 4-11, 14-17, 20, 21, 24, and 25 are allowable in their present form, and that this application is now in condition for allowance. It is, accordingly, respectfully requested that the Examiner so find and issue a Notice of Allowance in due course.

The Examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the Examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

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Respectfully submitted,

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